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No man's land in the Brazilian Amazon: Could undesignated public forests slow Amazon deforestation?

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ABSTRACT

Here we argue that a faster and more cost-effective way to reduce deforestation in the Brazilian Amazon would be the immediate allocation of ca. 70 million hectares of still undesignated public forestlands to conservation and social use. Currently, this massive block of forests is not under effective supervision by a designated public agency, increasing the risk of continued land grabbing and predatory use. These undesignated public lands accounted for 25% of recent deforestation, emitting 200 million tons of CO_2. Under the current scenario of deforestation growth in the region, the immediate allocation of undesignated forestlands to conservation or social use by the government will reduce the availability of unsupervised public land, increase forest protection and, therefore, decrease deforestation and carbon emissions. Additionally, the action would send an unmistakable sign to the international community of Brazil's will to increase governance of its large share of the Amazon forest.

The conversion of Amazon forests into pasture and agricultural land is the main source of Brazil's GHG emissions (SEEG Brasil, 2016; Moutinho et al., 2016). Despite high historical deforestation rates, the Brazilian Amazon still stores 39 billion tons of Carbon (or ~150 billion tons CO_2; CCAL, 2017) in 302 million hectares of forests (INPE, 2016). Despite a 74% reduction in Amazon deforestation (from 19,014 km^2 in 2005–5,012 km^2 in 2014; INPE 2016), the annual rate of deforestation has been stuck around 5–6,000 $km^2\,y^{-1}$ since 2012 (Moutinho et al., 2016) and it is now growing again (~8000 km^2 in 2016; INPE, 2016). Amazon forests remain under enormous pressure from agribusiness, mining, livestock, energy and land grabbing, among others – a scenario made even more contentious by unclear land tenure and frequent land disputes. Today, many of these conflicts occur in public lands, most of which are still covered by pristine forests.

In Brazil, 92% (288 million hectares) of the 312.6 million hectares of Brazilian public forests is in the Amazon (SFB, 2016). What is not widely known is that 70 million hectares ha of that public land – an area nearly twice the size of Germany (Fig. 1) – remains undesignated, containing forests that store an estimated 25 billion tons of CO_2 (SFB, 2016). The failure of federal and state governments to allocate these areas to a specific use has led to inadequate supervision by a designated public agency, making these forestlands an easy target for land grabbing and other unscrupulous uses. The resulting land disputes has increased Brazil's deforestation rate and continues to hinder progress towards achieving zero-deforestation targets.

A large proportion (25%) of recent deforestation has occurred within undesignated public forests (Moutinho et al., 2016, Fig. 1). From 2010 to 2015 the accumulated deforestation in undesignated Amazon forestlands reached 4000 km^2 (Moutinho et al., 2016), resulting in emissions of at least 200 million tons of CO_2.[1] This amount of CO_2 is equivalent to almost 50% of Brazil's annual emissions from its energy sector (~430 million tons of CO_2; ref. year 2016; SEEG Brasil, 2016).

Despite some challenges (Forrest et al., 2015; Pack et al., 2016), several studies indicate that Amazon protected areas are an effective deterrent to deforestation (Soares-Filho et al., 2010; Barber et al., 2014; Spracklen et al., 2015; Porter-Bolland et al., 2012; Walker et al., 2014), regardless of whether they are managed by federal or state governments, or indigenous people. The designation of public forests as protected areas (e.g., parks or national forests) or other social category (e.g. forest rural settlements, community use and indigenous land) thus has the potential to reduce illegal deforestation in these areas. Given the critical ecological functions of these forests (Silvério et al., 2015), such actions to control land grabbing and forest conversion should be prioritized.

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[1] Total area deforested multiplied by the carbon density adopted by the Amazon Fund – 499 tons of CO_2 ha^{-1}.

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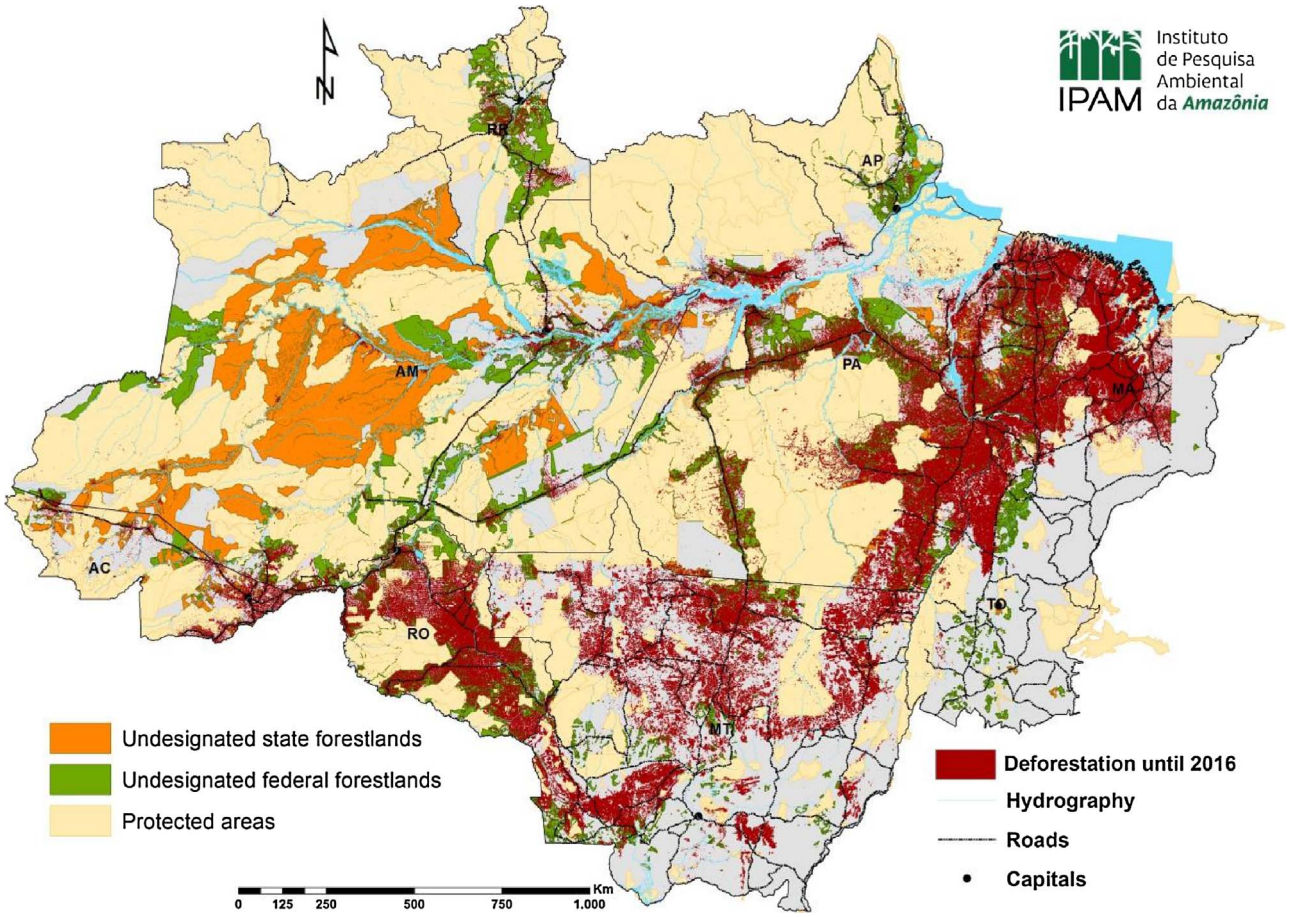

Fig 1. Public forests of the Brazilian Legal Amazon and its 70 million hectares of undesignated forestlands (Source: SFB, 2016).

In areas near deforestation threats, sustainable use areas may be more effective in avoiding deforestation than strict protected areas, since they encourage a local forest economy (Soares-Filho et al., 2010; Pfaff et al., 2014) that increases local forest value, benefit sharing, and revenues (Lima et al., 2006; Merry et al., 2009; Azevedo-Ramos et al., 2015). In the process, these forest economies can create allies with a vested interest in forest conservation, helping to promote active forest stewardship.

To avoid the risks associated with a long, bureaucratic land designation process, we propose a staged approach, including a transitional phase. For instance, large blocks of land could be placed under temporary administrative boundaries and under the jurisdiction of the appropriate government agency. Undesignated forestlands might thus be split among the agencies responsible for protected areas, indigenous people and agrarian reform, depending on their suitability for each of these uses. Detailed studies and participatory consultation would determine the best category for each area in the near future. Until that time, there would be a moratorium on conversion of public forests to other land uses. At the local level, such action would be perceived as an increase in government oversight and protection of those lands, which would inhibit the typical predatory behavior (land grabbing and illegal use). A similar mechanism has been successfully applied during the paving of Amazon highways, when population migration was expected. For example, areas of the Cuiaba-Santarem highway (BR-163) in Pará state were placed under “Provisional Administrative Limitation” as were regions of the Manaus–Porto Velho highway in Amazonas State (Fearnside et al., 2009).

With decisive action, the pool of undesignated forestlands in the Brazilian Amazon represents an enormous opportunity to improve protection of the Amazon ecosystem. Failure to act would render these same areas as the Achilles heel of Amazon conservation – a conduit for illegal activities and unchecked deforestation in the very heart of the Amazon biome. The immediate allocation of undesignated public forests for protection has the potential to be the fastest and most cost-effective way to curb deforestation in the region. By setting aside this extensive block of undesignated Amazon forestlands for social and environmental protection, Brazil would send an unambiguous signal of its intent to increase governance and improve conservation of its outsized share of the Amazon forest. In addition, the success of programs to avoid forest carbon emissions in tropical countries depends mostly on Brazil (Zarin et al., 2015). Through bold forest conservation projects like those suggested here, Brazil could rapidly achieve its “Nationally Determined Contributions” (NDCs) announced during the 21 st Conference of the Parties to the UN Framework Convention on Climate Change.

Declarations of interest

none

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References

Azevedo-Ramos, C., Silva, J.N.M., Merry, F., 2015. The evolution of Brazilian forest concessions. Elem. Sci. Anth. 3, 48. http://dx.doi.org/10.12952/journal.elementa.000048.

Barber, C.P., Cochrane, M.A., Souza Jr., C.M., Laurance, W.F., 2014. Roads, deforestation, and the mitigating effect of protected areas in the Amazon. Biol. Conserv. 177, 203–209.

CCAL, 2017. Carbon Calculator Amazon Environmental Research Institute (IPAM). (Accessed on 20th May 2017) Available at http://www.carboncal.org.br/view/brasil/.

Fearnside, P.M., Graça, P.M.L.A., Keizer, E.W.H., Maldonado, F.D., Barbosa, R.I., Nogueira, E.M., 2009. Modelagem de desmatamento e emissões de gases de efeito estufa na região sob influência da rodovia Manaus-Porto Velho (BR-319). Rev. Bras. Meteorol. 24 (no. 2). http://dx.doi.org/10.1590/S0102-77862009000200009.

Forrest, J.L., Mascia, M.B., Pailler, S., Abidin, S.Z., Araujo, M.D., Krithivasan, R., Riveros, J.C., 2015. Tropical deforestation and carbon emissions from protected area downgrading downsizing, and degazettement (PADDD). Conserv. Lett. 8 (3), 153–161. http://dx.doi.org/10.1111/conl.12144.

INPE, 2016. INPE- instituto nacional de pesquisas espaciais. Projeto PRODES. São José dos Campos, SP(Access on 20th Jan. 2017) Available at http://www.dpi.inpe.br/prodesdigital/prodes.php.

Lima, E., Merry, F., Nepstad, D., Amacher, G., Azevedo-Ramos, C., Lefebvre, P., Resque Jr., F., 2006. Searching for sustainability: forest policies, smallholders, and the trans-Amazon highway. Environment 48 (1), 26–38.

Merry, F., Soares-Filho, B., Nepstad, D., Amacher, G., Rodrigues, H., 2009. Balancing conservation and economic sustainability: the future of the amazon timber industry. Environ. Manage. 44 (3), 395–407.

Moutinho, P., Guerra, R., Azevedo-Ramos, C., 2016. Achieving zero deforestation in the Brazilian Amazon: what is missing? Elem Sci Anth 4http://dx.doi.org/10.12952/journal.elementa.000125. (000125).

Pack, S.M., Ferreira, M.N., Krithivasan, R., Murrow, J., Bernard, E., Mascia, M.B., 2016. Protected area downgrading downsizing, and degazettement (PADDD) in the Amazon. Biol. Conserv. 197, 32–39.

Pfaff, A., Robalino, J., Lima, E., Sandoval, C., Herrera, L.D., 2014. Governance, location and avoided deforestation from protected areas: greater restrictions can have lower impact, due to differences in location. World Dev. 55, 7–20.

Porter-Bolland, L., Ellis, E.A., Guariguata, M.R., Ruiz-Mallén, I., Negrete-Yankelevich, S., Reyes-García, V., 2012. Community managed forests and forest protected areas: an assessment of their conservation effectiveness across the tropics. For. Ecol. Manage. 268, 6–172.

SEEG Brasil, 2016. System Study Greenhouse Gas Emissions Estimates (SEEG). (Accessed on 6th November 2017) Available at: http://plataforma.seeg.eco.br/total_emission.

SFG, 2016. SFB-Serviço Florestal Brasileiro National Cadastre of Public Forest. (Acessed on 10th February 2017) Available at www.florestal.gov.br.

Silvério, D.V., Brando, P.M., Macedo, M.N., Beck, P.S.A., Bustamante, M., Coe, M.T., 2015. Agricultural expansion dominates climate changes in southeastern Amazonia: the overlooked non-GHG forcing. Env. Res. Lett. 10, 104–105.

Soares-Filho, B., Moutinho, P., Nepstad, D., Anderson, A., Rodrigues, H., Garcia, R., Dietzsch, L., Merry, F., Bowman, M., Hissa, L., Silvestrini, R., Maretti, C., 2010. Role of Brazilian Amazon protected areas in climate change mitigation. Proc. Natl. Acad. Sci. U. S. A. 107 (24), 10821–10826.

Spracklen, B.D., Kalamandeen, M., Galbraith, D., Gloor, E., Spracklen, D.V., 2015. A global analysis of deforestation in moist tropical forest protected areas. PLoS One 10 (12), e0143886. http://dx.doi.org/10.1371/journal.pone.0143886.

Walker, W., Baccini, A., Schwartzman, S., Ríos, S., Oliveira-Miranda, M.A., Augusto, C., Ruiz, M.R., Arrasco, C.S., Ricardo, B., Smith, R., Meyer, C., Jintiach, J.C., Campos, E.V., 2014. Forest carbon in Amazonia: the unrecognized contribution of indigenous territories and protected natural areas. Carbon Manage. 5 (5–6), 479–485. http://dx.doi.org/10.1080/17583004.2014.990680.

Zarin, D.J., Harris, N.L., Baccini, A., Aksenov, D., Hansen, M.C., Azevedo-Ramos, C.A., Azevedo, T., Margono, B.A., Alencar, A.C., Gabris, C., Allegretti, A., Potapov, P., Farina, M., Walker, W.S., Shevade, V.S., Loboda, T.V., Turubanova, S., Tyukavina, A., 2015. Can carbon emissions from tropical deforestation drop by 50% in five years? Global Change Biol. 22 (4), 1336–1347. http://dx.doi.org/10.1111/gcb.13153.